CST1204: Introduction to Databases

Jun Shan
Adjunct Professor
City Tech, CUNY

Week 3 Session 2

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Previous Session Review

- Introduction to Oracle
- Introduction to SQL
- Creating and dropping a table

PRIMARY KEY

- Can be specified either at table property section or at column property section:
  - Single Column Primary Key
  - Multi Column Primary Key

```
CREATE TABLE ORDER_LINE
(ORDER_NUM CHAR(5),
ITEM_NUM CHAR(4),
NUM_ORDERED DECIMAL(3,0),
QUOTED_PRICE DECIMAL(6,2),
PRIMARY KEY (ORDER_NUM, ITEM_NUM) );
```

```
CREATE TABLE REP (
REP_NUM CHAR(2) PRIMARY KEY,
LAST_NAME CHAR(15),
FIRST_NAME CHAR(15),
STREET CHAR(15),
CITY CHAR(15),
STATE CHAR(2),
POSTAL_CODE CHAR(5),
COMMISSION DECIMAL(7,2),
RATE DECIMAL(3,2) );
```

Convert Shorthand Rep to CREATE

```
CREATE TABLE <table_name> (
<column_1_definition>...
);
```

- Use entity/relationship name as `<table_name>`
- Use attribute name as column name, one attribute is one column
- Add column type to each column
- Add Primary Key constraint to primary key column(s)
- Add comma to the end of all columns except for the last column

Homework Review

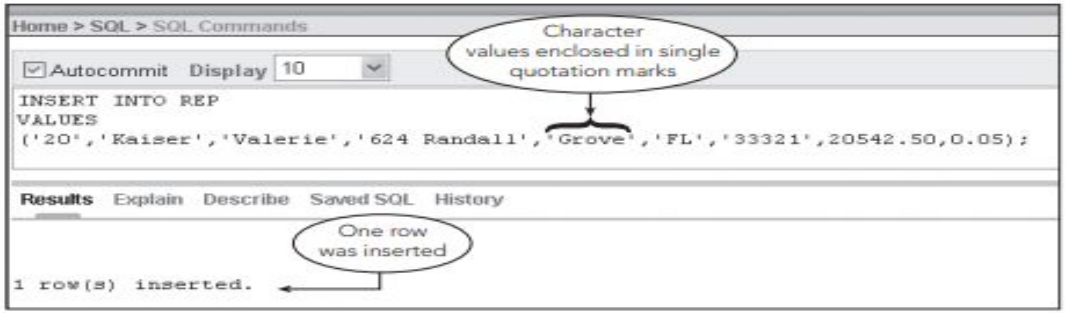
- Review previous homework: CREATE tables for TAL Distributors
- Chapter 2 exercise questions for TAL Distributors
  - Use Entity/Relationship name, not ID
- Quick tips
  - Create/Drop
  - Case insensitive

Agenda

- INSERT data
- Data Type and Data Storage
- Correct data mistakes
- Simple SQL statements

Simple INSERT Statement

- Simple INSERT statement (Ch 3 Pg 73)



- Statement syntax

```
INSERT INTO <table_name> VALUES (<value_list>)
```

Simple SELECT Statement

- Simple SELECT statement (Ch 3 Pg 73)

- Statement syntax: Asterisk (*) means all columns.

```
SELECT * FROM <table_name>
```

Data Type Deepdive

- Data Type concepts: how does data exist in computer systems?
- Common Data Types (Ch 3 Pg 71)
  - INT
  - DECIMAL(p,s)
  - CHAR(n) vs VARCHAR(n)
  - DATE

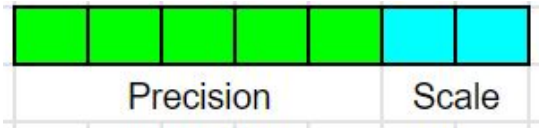
CHAR and VARCHAR

- Single quote delimited string: ‘city’, ‘Tech’
- Case sensitive inside string
- CHAR(n) and VARCHAR(n): Size limit
    - INSERT ‘This is too long’ into CHAR(5)
- Difference
    - ‘#’ || CHAR(n) || ‘#’ vs ‘#’ || VARCHAR(n) || ‘#’

Decimal

- No quote, no comma: 123, 12345.67
- DECIMAL(precision,scale)

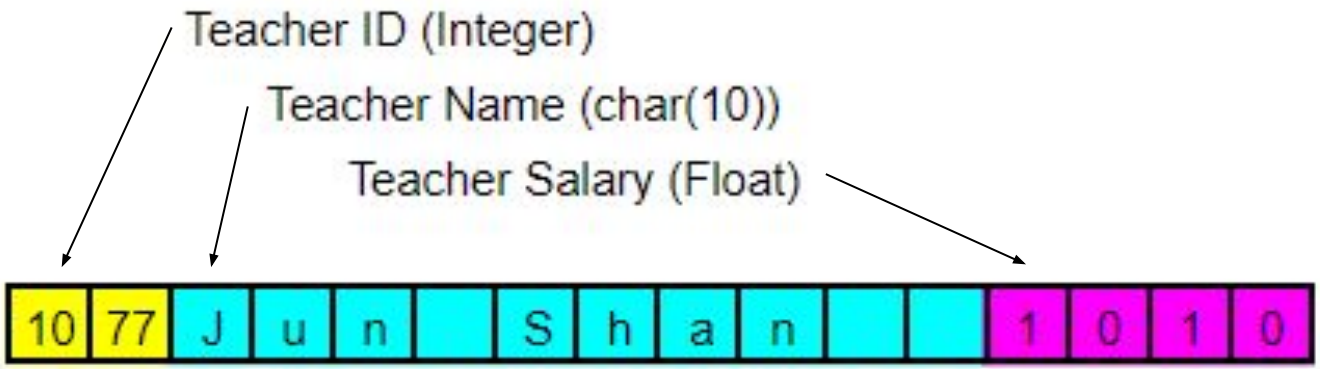
DECIMAL(7,2)



- Precision and scale limit
  - INSERT DECIMAL(5,2) with 1234.56
  - INSERT DECIMAL(7,0) with 1234.56

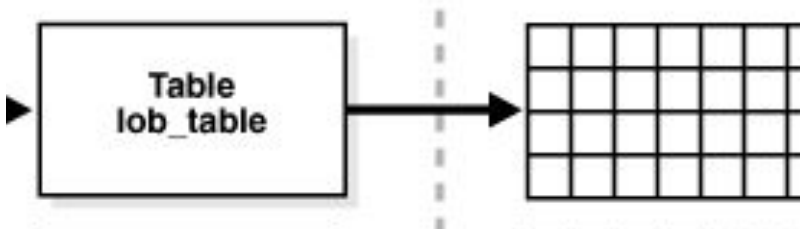
Data Storage

- How is a row stored?



Data Storage

- How is a database table stored:
  - Each row is stored as a sequential block



Data Type Samples

SQL Demo

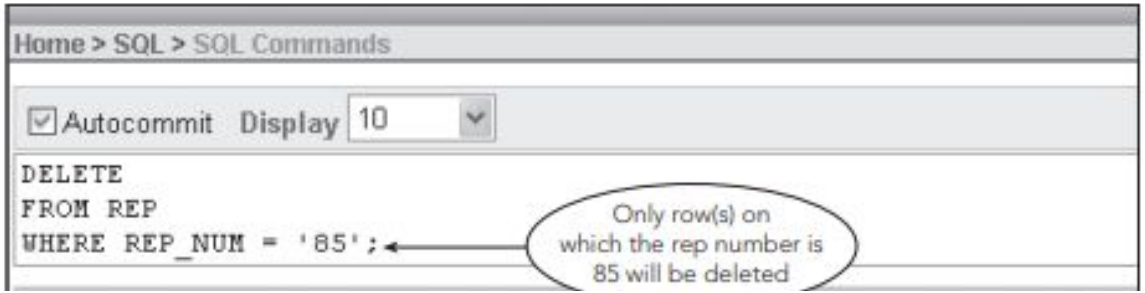
Correct Data Mistakes

Three approaches

1. DROP, re-CREATE, then re-INSERT
2. DELETE, then re-INSERT
3. UPDATE

Simple DELETE Statement

- Simple DELETE statement (Ch 3 Pg 77): Ignore WHERE for now

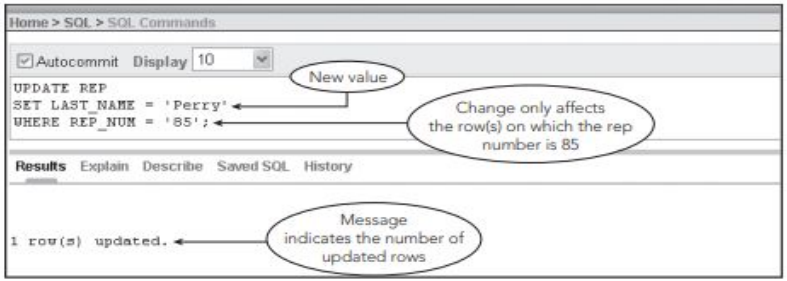


- Statement syntax: Delete all rows if WHERE clause not specified

```
DELETE FROM <table_name>
WHERE <boolean_expression>
```

Simple UPDATE Statement

- Simple UPDATE statement (Ch 3 Pg 76): Ignore WHERE for now



- Statement syntax: Update all rows if WHERE clause not specified

```
UPDATE <table_name> SET <column_name> = <value>
WHERE <boolean_expression>
```

Review of SQL Statements

- 2 types of statements
  - Data Definition Language (DDL): CREATE, DROP
  - Data Manipulation Language (DML): INSERT, UPDATE, DELETE, SELECT
- 4 basic types of data operations (in all computer science world)
  - Create, Read, Update, and Delete (CRUD)
- 6 most important statements of SQL
  - CREATE, INSERT, SELECT, UPDATE, DELETE, DROP

Hands-on

- Insert one row to each table for TAL Distributors
- Select from each tables
- Chapter 3 exercise questions for TAL Distributors

Homework

- Create shorthand representation for all TAL Distributors
  - Create CREATE statements for all tables
  - Create 1 INSERT statement + 1 SELECT for each table
- Chapter 2 exercise questions for TAL Distributors
  - Create shorthand representation for each exercise
  - Create CREATE statements for all changed tables
- Chapter 3 exercise questions for TAL Distributors

Review Learning Pattern

- Will give a scenario and ask you to
  - Normalize a bad design into 3NF
  - Identify entities and relationships and their primary key
  - Draw ERD
  - Write CREATE and DROP statements
  - Write further simple SQL statements